Integrated Petrophysics Courses for Carbonate and Fractured Reservoirs

This course presents the Complete Carbonate & Fracture Evaluation Recipe for carbonate petrophysical characterisation, from Quick Look log analysis to full Core-Log-Test integration. The course presents a systematic plan of action for Carbonate Petrophysics, from data acquisition to core, log and well test integration, highlighting the problems and explaining solutions. All data is ranked and located correctly in the workflow, from drilling and LWD to well tests and the latest hi-tech logs. This recipe provides a definitive set of results and secure basis for decisions for the management of any carbonate or complex reservoir. The course explains how the physical characteristics of Carbonates – tight, fractured, vuggy or permeable – present **log analysis Failure Points**. How to Drill, Core, Log, Test and evaluate specifically to address these failure points is explained via a condensed learning session of interleaved theory, PetroDB-WEB demos, workshops and videos. Drilling data, core, SCAL, logs, LithoScanner, NMR, Dielectric, Sigma, Acoustic, Image-logs and MDTs are all briefly explained and fitted together to form the definitive solution for any given data set. The course's powerful Excel **Carbonate Petrophysics Toolbox** includes all Workshops, a detailed Sw cap.press:n calibration, a vuggy Carbonate QL LAS evaluator, 100+ Eqns, PetroDB-WEB extracts, QL Sigma, HPV Sensitivities and calculators for Fracture Probability and Fracture ∅ & HPV.

This course provides a much needed systematic process for staff faced with the daunting prospect of managing Carbonate or other complex reservoirs. Non-petrophysicists will learn how to quickly review geo-model input using the author's ''Greenlists''.

This process has been adopted and used successfully by a numerous operators.

The complete recipe for Carbonate & Fractured reservoirs

Who Should Attend?

Petrophysicists. Geologists, Operations Geologists, Structural Geologists, Geo-modellers, Reservoir Engineers, Well Test Engineers or Core Analysts who use or create **petrophysics courses** results for carbonate or ‘‘complex’’ reservoirs. Basic principles are reviewed; however a year’s experience in formation evaluation is desirable. Bring your laptop with MS Excel.

You Will Learn

– The physical differences between Carbonates and Clastics and their data response implications

– Why extreme pores, vugs, fractures and oil wetness occur in carbonates and how to recognize and treat them

– Carbonate & Fracture petrophysical essentials. The **Carbonates Failure Points** which must be identified & healed

– Why fracture well tests can be misleading and what **other critical data** you must have

– How common errors impact results using PetroDB-WEB interactive demos

– How to acquire and integrate key drilling, mudlog, core, special log and well test data

– How to do Quick Look Carbonate Log Analysis and integrate capillary pressures with logs in Excel, PetroDB-WEB, IP and other software packs

– How to derive **Reservoir Rock Type Equation Sets** and apply them with modern logs

– How to do thorough, integrated and robust evaluations in any complex, conventional reservoir

– How end-users can critically review complex petrophysical results using the author's **Petrophysical Greenlists**

Course Content

Detailed Contents

– How Physical Characteristics impact 1) Reservoir properties 2) Reservoir measurements

– Carbonate & Fracture Reservoir classifications: Lucia, Nelson, Aguilera

– Total porosity + Clays vs Total porosity + Pore geometry. What to do!

– How to use data and equations intelligently. Understanding Data Redundancy, Hierarchy and Equation Inversion

– Misleading Data, Useful Data, Powerful Data. The Carbonate & Fracture database essentials

– Petrophysical Greenlists: The tests you must apply to received data sets

– Carbonate Quick Look Excel template with 100+ key equations for complex reservoir evaluation

– Reservoir Rock Types, PetroDB, Analogues, Sigma & Dielectric logs, Cap. Pressure, FZI, R35, Rock Typing, Core Sw, Which Sw? NMR porosity bins, Timur-Coates carbonate permeability, Sonic logs, Stoneley permeability, Stress, Fracture Quantification

– **The Complete Carbonate & Fracture Evaluation Recipe:** Principles, Data and A-Z Information Flow

– The Petrophysics to Geo-model checks which really matter! Is your permeability relevant?

– 5 days of petrophysical saturation: Morning Recaps: Do This, Don't Do That! PetroDB-Vault interactive demos; Micro-practicals; Movies; Workshops; 25+ years' experience and debate

The Instructor CV

Dr Mark Deakin is a consultant, author and lecturer in Petrophysical Data Integration. He holds a Ph.D. in 'Integrated Petrophysics' from London's Imperial College, is an ex Amoco petrophysicist, and has 25 years experience, including 12 as a lecturer and director of PETROPHYSICS Pty Ltd. He has performed over 50 detailed reservoir studies, primarily in Southeast Asia's difficult carbonate and stacked 'low-contrast-pay' reservoirs, keeping abreast of new technologies by technical reading, operations work, attending short courses and lecturing. Deakin's proven approach is to identify and rank reserves uncertainties then guide companies toward defensible reserves via a process of targeted data acquisition, data-hierarchy and systematic integration. After his PhD Deakin authored the first public Integrated Petrophysics course

which has evolved into the industry benchmark course for mainstream petrophysics. Deakin also developed ‘‘Carbonates & Fracture Petrophysics – A Roadmap’’ and the powerful PetroDB-Vault core-log-test linked database evaluation for complex reservoirs. Deakin is a member of SPWLA with offices in Perth, Australia.